Office for National Statistics

Article

Technology intensity and homeworking in the UK

Recent trends and insights into technology as an enabler for homeworking. Analysis considers differences in technology usage across industries.

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1 . Main points

- Homeworking opportunities vary significantly between industries, with 10% of employees within the accommodation and food services industry reporting having ever worked from home (in 2019) compared with 53% of those in the information and communication industry.
- The extent to which an employee can work from home depends on whether a specific physical environment, tools, or proximity to other people are required for the role.
- Technology can be an enabling power for homeworking, providing employees have the access to, and skills required for, technology.
- The E-commerce Survey shows that in 2018, less than half of all employees were provided with a portable device for work, except in the information and communication industry where around 60% of employees were provided with a portable device.
- The Office of Communications (OFCOM) found superfast broadband coverage reached 95% of residential homes in the UK in September 2019.
- In the accommodation and food services, and retail industries, over 85% of businesses using social media, used it to develop brand image and for marketing purposes.
- Businesses with 10 or more employees were more likely to employ ICT specialists than smaller businesses.

2 . Understanding homeworking and technology

The coronavirus (COVID-19) pandemic has put an increased focus on the manner in which people work. Measures introduced by the UK government to contain the coronavirus include guidance to work from home if possible.

A new module being undertaken through the Office for National Statistics (ONS) Opinions and Lifestyles Survey (OPN) provides insight into the impact of the coronavirus pandemic on British society. During the period 9 April to 20 April 2020, the OPN found that 45% of adults in employment said they had worked from home at some point in the last week.

The Business Impact of Coronavirus Survey (BICS) delivers timely indicators to help understand the impact of the coronavirus from a business perspective. During the period 23 March to 5 April, of those businesses who responded to the Business Impact of Coronavirus Survey the average proportion of the workforce that was working remotely from their normal place was 48%.

The extent to which an employee can work from home depends on whether a specific physical environment, tools, or proximity to other people are required for the role. The technological capability of employers and employees also needs to be high enough to enable efficient home working. If technology can be accessed and used from home, it partially reflects the ability of a business to switch to remote working arrangements.

Office for National Statistics (ONS) analysis into information and communication technology intensity previously found a saturation of adoption of basic technologies, which are commonplace and integral to routine business functions. Analysis also recognised the commonly held notions about the productivity benefits of technology, within the data.

In order to examine the ability of each industry to engage in homeworking arrangements, this analysis has developed three sub-categories of technology intensity indicators:

- accessibility – the ability of employees to work from home may partially depend on their ability to access the required technology for their work
- usage – the use of technological services, such as social media and information-sharing software, for business purposes may facilitate homeworking arrangements
- skills – information and communication technologies employment and training may reflect the workforce's technological capacity

These are described more fully in Sections 4, 5 and 6 of this article respectively.

Many of the technology intensity indicators are from the E-commerce Survey[1]. This survey samples over 7,000 UK businesses annually and measures the adoption and use of existing and emerging information and communication technology, and e-commerce activity.

Notes for: Understanding homeworking and technology

1. The survey covers all industries except those in:
    - agriculture, forestry and fishing
    - mining and quarrying
    - veterinary activities
    - public administration and defence
    - social security
    - education
    - health and social work
    - arts, entertainment and recreation
    - other service activities except repair of computers

3 . Homeworking by industry

This article builds on previous analysis into coronavirus (COVID-19) and homeworking, which showed that in 2019, around 1.7 million people reported working mainly from home.

Figure 1: Around one third of employees in the information and communication industry worked from home in the week prior to the survey

Percentage of UK workforce homeworking by industry, 2019

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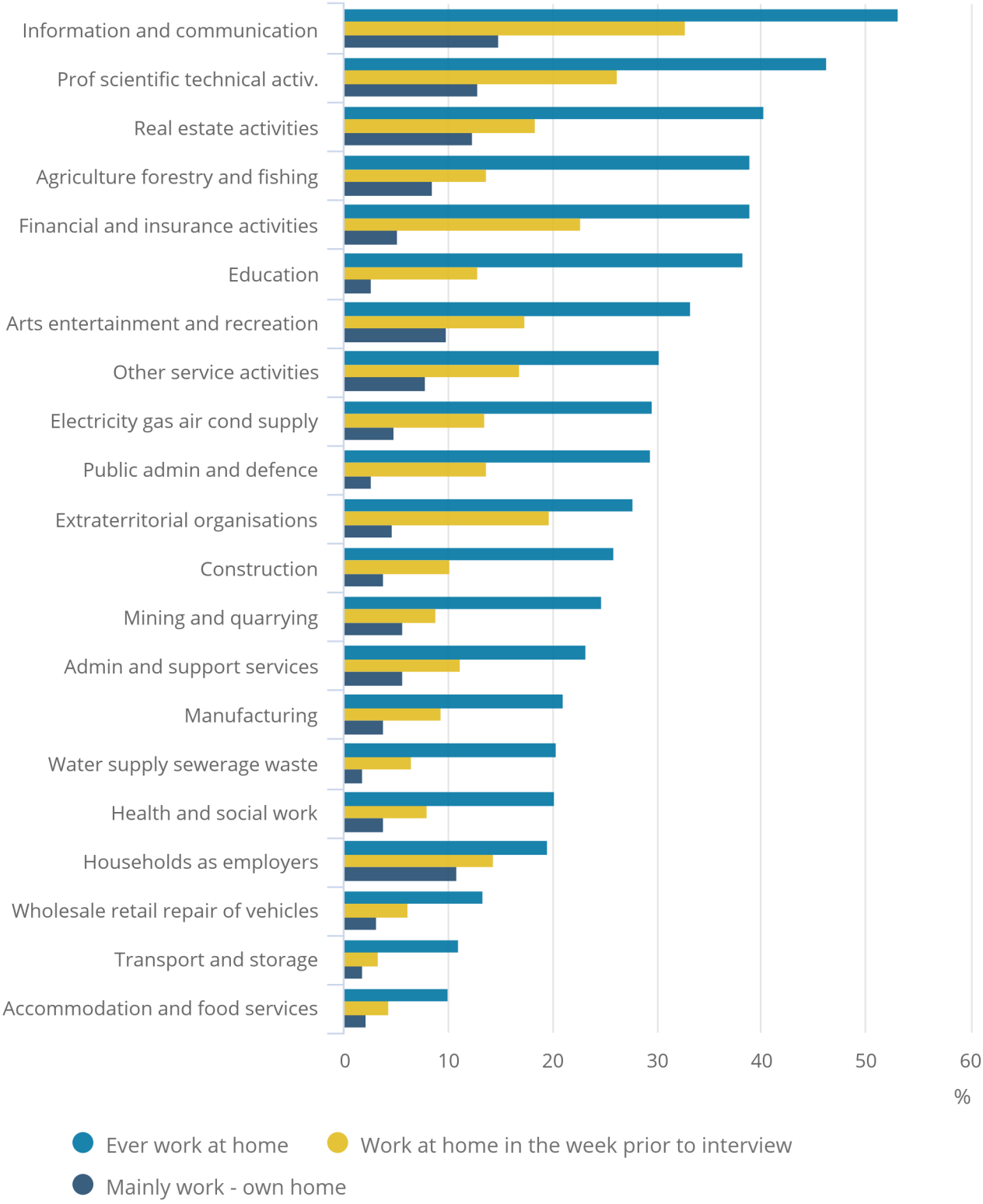
Percentage of UK workforce homeworking by industry, 2019



Source: Office for National Statistics – Annual Population Survey

One week prior to the 2019 survey, almost one-third of employees in the information and communication industry reported working from home. Similarly, over one-quarter of those in the professional, scientific and technical activities industry worked from home in the week prior to the survey. These industries include those working in consultancy, research and development, and language translation services, which typically involve technology and may be less reliant on being located in specific premises to undertake the work. The industry also includes, however, veterinary activities, which generally require the location to be specified.

The accommodation and food services industry offered limited opportunity to work from home with only 10% of employees having ever worked from home. Jobs in these industries may require direct contact with customers within the physical environment of, for example, restaurants and bars, making homeworking less possible.

The largest industry (in terms of employment level) is health and social work. Around one-fifth of employees reported ever working from home. Employees in this industry include nurses, doctors and care providers who require face-to-face contact with individuals, restricting homeworking.

It should be noted that in some cases, just because people can and do work from home on some occasions, this does not necessarily mean that this is done on an ongoing basis. For example, this is likely to be the case in the education industry, which had a relatively high percentage reporting that they had worked from home. This may reflect certain activities such as planning and marking, which can take place at home, whereas very few people in this industry reported that they mainly worked from home.

4 . Accessibility

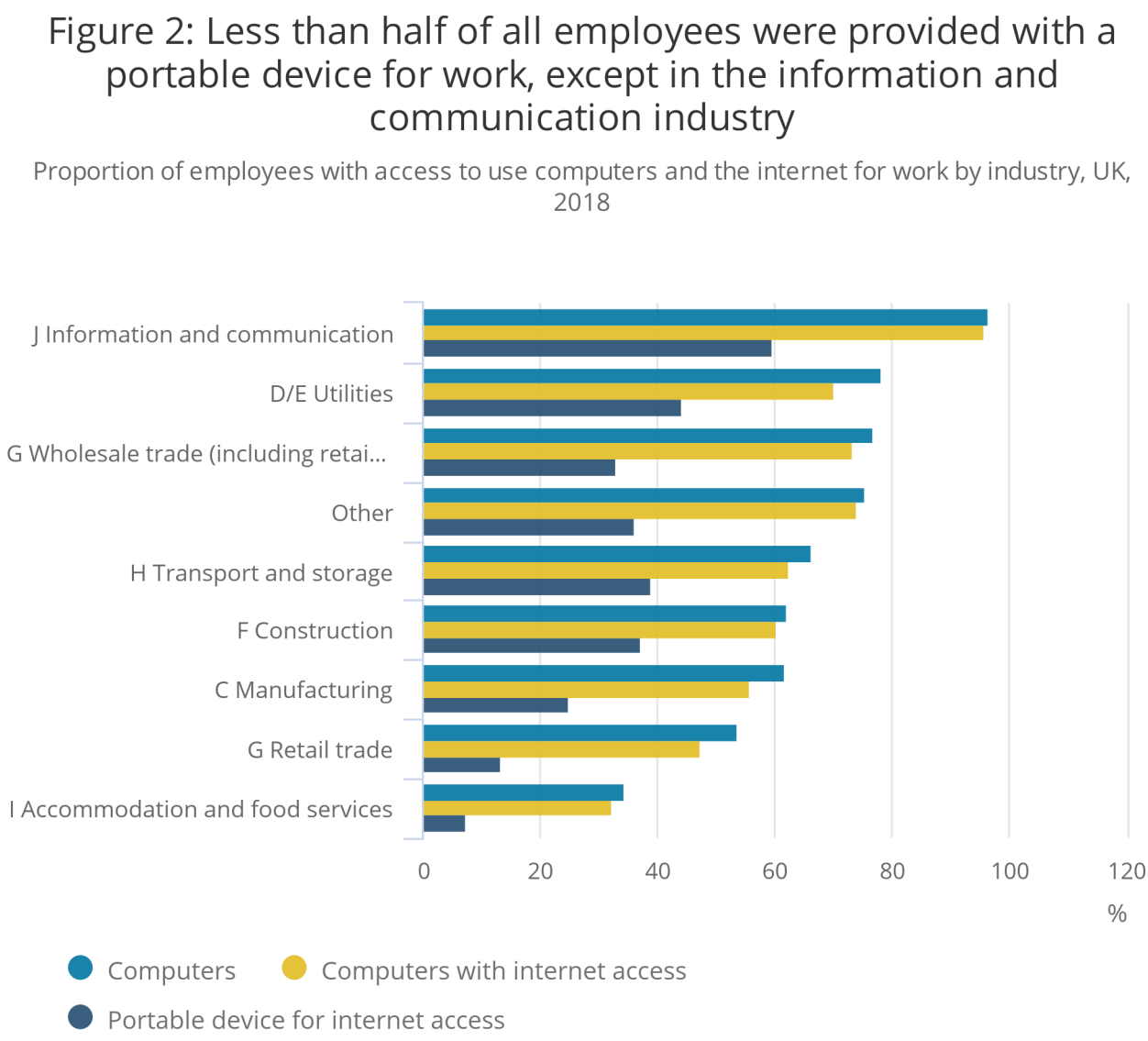
Information and communication technologies have become more advanced and lower in price over time, however, affordability and the physical ability to access and use technology may constrain homeworking for some businesses and employees. Office for National Statistics (ONS) analysis exploring the digital divide showed that while digital inclusion has been increasing in recent years and there are some clear benefits for both the individual and wider society, some people remain digitally excluded. This is particularly the case among certain groups, including older people and disabled people.

Connectivity by industry

As society becomes increasingly connected, there is a need for businesses to better use technology. Access to technology varies across industries and is, in many cases, determined by the occupations employees fulfil. The E-commerce Survey provides insight into the usage of computers with access to the internet and the provision of a portable device for work.

Figure 2: Less than half of all employees were provided with a portable device for work, except in the information and communication industry

Proportion of employees with access to use computers and the internet for work by industry, UK, 2018



Source: Office for National Statistics - E-commerce survey

Notes:

1. G Wholesale retail repair of vehicles has been split into Retail trade (47) and Wholesale trade with retail trade and repair of vehicles (45 and 46).

2. Other includes: L Real estate activities, M Professional, scientific and technical activities (excluding 75 Veterinary activities), N Admin and support services, 95.1 Repair of computers and communication equipment.

The industries with the highest proportion of employees using a computer were information and communication, utilities, and wholesale trade. Around 34% of workers in the accommodation and food services industry used a computer for work. In this industry, many roles require face-to-face contact, which may not require a computer.

Having a portable device for work, such as a work-issued laptop or smartphone, may be vital in enabling effective remote working. Around 13% of employees in the retail trade industry had been provided with a portable device for work, while around 60% of employees in the information and communication industry had.

It should be noted that access to a portable device does not enable homeworking if the tasks cannot be fulfilled using the technology. This is particularly relevant for the construction industry where 37% of employees had been provided with a portable device, but this is likely to support work on-site, and it would be difficult to carry out work from home, even with this portable device.

Regional internet connectivity

Despite being an integral part of modern society, internet accessibility is not homogenous across the UK. The Office of Communications (OFCOM)'s 2019 Connected Nations report (PDF, 1.9MB) found superfast broadband coverage reached 95% of residential homes in the UK, and 86% of business and commercial properties. Superfast broadband is defined by OFCOM as having a minimum download speed of at least 30 megabits per second. In order to be able to use the technology to its full potential, internet speeds need at least to be sufficient enough to support a range of different applications.

Figure 3: Urban areas have higher proportions of residential properties with access to services above 30Mbit/s (megabits per second) from fixed broadband

Proportion of residential properties that do not have access to services above 30Mbit/s from fixed broadband by local and unitary authority, UK, September 2019

Source: OFCOM Connected Nations

Download the data

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The regional difference in internet speeds affects industries differently depending on the employment share in each industry and region.

Figure 4: There is considerable variation in the types of jobs that employees undertake in regions across the country

Workforce jobs by industry and region, UK, December 2019

Notes:

1. Other includes: L Real estate activities, M Professional, scientific and technical activities, N Admin and support services

2. Data are provisional for December 2019

3. NE: North East, NW: North West, YH: Yorkshire and The Humber, EM: East Midlands, WM: West Midlands, E: East of England, LN: London, SE: South East, SW: South West, WA: Wales, SC: Scotland, NI: Northern Ireland

Download the data

.xls

Figure 3 shows London boroughs to generally have lower proportions of those without superfast broadband. In this region, around 27% of the workforce were employed in real estate activities, professional, scientific and technical activities, and admin and support services. Figure 1 shows that real estate activities, and professional, scientific and technical activities, had higher rates of homeworking than most other industries.

As previously highlighted, not all industries can transfer their workforce to homeworking because of the specific environment or settings that are required. This may be particularly applicable within the wholesale and retail trade industries in which over 10% of employees in all regions worked.

When only considering internet speed and the type of jobs most common, and in the absence of all other factors, homeworking for those who normally work in London appears more possible than in other regions.

Further analysis of employment share by industry and region is available in the spatial distribution of industries in Great Britain.

Investment in ICT and software assets

Investment in information and communication technology (ICT) and software offers insight into those industries with the greatest spending and therefore assumed availability of technology.

Figure 5: The information and communication industry invested almost double that of the utilities industry on information and communication technology and software assets per worker

Investment on information and communication technology and software assets per worker by industry, UK, 2019

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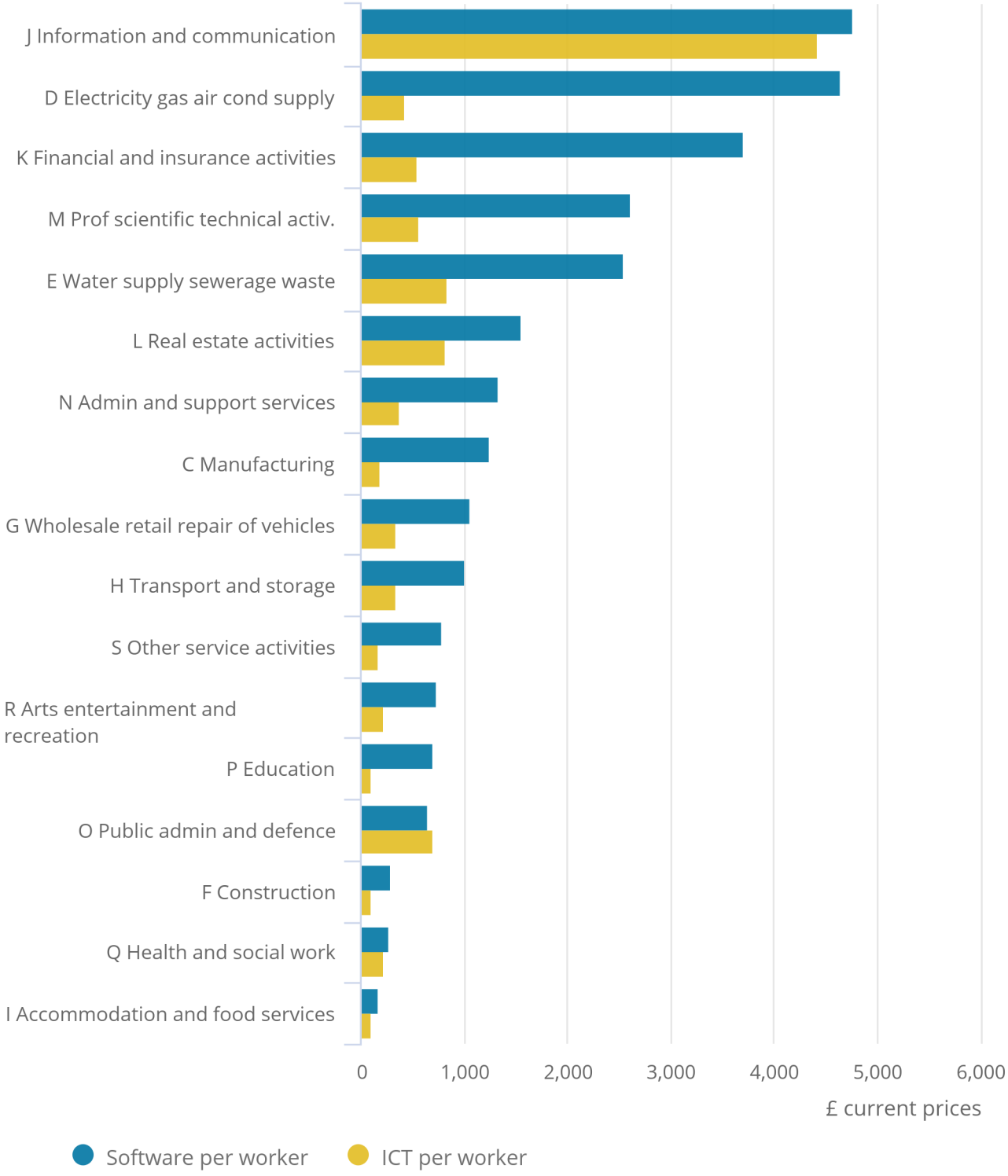

Source: Office for National Statistics - Gross fixed capital formation

Notes:

1. Employment by industry data are from the coronavirus (COVID-19) and homeworking data.

The information and communication industry invested £9,196 per employed worker compared with £272 in the accommodation and food services industry. The financial and insurance activities, the professional, scientific and technical activities, and the real estate activities industries rank amongst the highest in both the percentage of workers reporting working from home and investment per worker in ICT assets and software.

If investment on ICT and software was the only factor in working from home, we would expect industries with the greatest investment per worker to have the highest proportion of employees working from home. Notable exceptions include the water supply industry, which ranks highly in terms of investment on ICT and software per worker and shows one of the smallest proportions of employees working mainly from home. This could be partially explained by the type of ICT or software asset a business invests in.

5 . Usage

The Oxford Internet Survey 2019[1] provides insight into the usage of the internet across the UK. Analysis finds that internet use has stabilised at very close to 100% for almost everyone below the age of 50 years, and at over 90% for everyone with an income of at least £20,000 per year. The primary location of use remains the home, but work use, library use and mobile use have all increased. In 2019, 60% of users reported using the internet from school or work, up from 40% in 2013.

Of the people who responded to the Labour Force Survey saying they work from home in their main job, 86.7% of them use both a telephone and computer when they work from home, as in April to June 2019. Of those people that do use both a telephone and computer to work from home, 90.7% of them say that they would not be able to work from home without both their telephone and computer, as in April to June 2019. These percentages remained fairly similar over the preceding few years. This indicates that the use of telecommunications technology is almost a necessity to be able to work from home.

Table 1: Percentage of employed people who work from home in their main job who use both a telephone and computer to carry out work at home
By region or country, UK, 2015 to 2019

Region or country	April to June 2015	April to June 2016	April to June 2017	April to June 2018	April to June 2019
North East	87.0	79.7	78.2	93.9	86.4
North West	83.9	86.1	85.9	85.2	85.4
Yorkshire and The Humber	83.4	84.6	85.9	82.4	84.1
East Midlands	88.4	88.2	86.7	85.6	87.4
West Midlands	82.9	88.7	85.3	86.4	87.5
East of England	85.2	81.5	85.5	90.0	86.2
London	84.2	85.8	84.3	84.2	87.1
South East	85.7	90.1	90.0	88.4	89.2
South West	86.6	83.5	86.6	87.4	88.8
Wales	78.8	84.0	87.8	86.0	78.7
Scotland	85.8	85.2	85.7	87.8	86.7
Northern Ireland	76.5	74.0	75.9	75.6	75.3
UK	84.9	85.7	86.2	86.5	86.7

Source: Office for National Statistics - Labour Force Survey

Notes:

1. Results are shown for the April to June quarter of the Labour Force Survey in each year, as this is the quarter in which this question is asked in the survey.

2. Figures include employees, self-employed and unpaid family workers but not government trainees aged 16 and above.

3. Figures include people who work at home, in the same grounds or buildings as their home, and people who work in different places but with their home as a base, but excludes people who work "somewhere quite separate from home".

4. Results are based upon the variables HOME which asks respondents whether they are working from home in their main job, and TELEQA which asks whether respondents used both a telephone and computer to carry out work at home. TELEQA is only asked of main respondents to the survey. For more information about these variables, see the Labour Force Survey user guidance

Table 2: Percentage of employed people who use both a telephone and computer to work from home in their main job who would not be able to work without both telephone and computer
By region or country, UK, 2015 to 2019

Region or country	April to June 2015	April to June 2016	April to June 2017	April to June 2018	April to June 2019
North East	88.2	94.1	95.3	87.7	94.4
North West	90.2	89.2	91.1	91.6	86.3
Yorkshire and The Humber	90.6	93.2	90.6	89.6	90.0
East Midlands	91.2	88.3	91.0	88.1	91.0
West Midlands	90.8	90.9	90.2	91.0	89.6
East of England	92.2	93.6	91.8	88.6	92.4
London	90.5	90.7	91.5	90.6	90.8
South East	90.9	91.1	90.9	89.8	92.4
South West	89.2	91.9	90.5	92.7	91.2
Wales	90.7	90.3	86.2	90.4	88.8
Scotland	88.3	90.2	93.4	87.0	91.1
Northern Ireland	90.8	84.6	90.9	88.0	88.9
UK	90.5	91.1	91.0	90.0	90.7

Source: Office for National Statistics - Labour Force Survey

Notes:

1. Results are shown for the April to June quarter of the Labour Force Survey in each year, as this is the quarter in which this question is asked in the survey.

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4. Results are based upon the variables HOME which asks respondents whether they are working from home in their main job, TELEQA which asks whether respondents used both a telephone and computer to carry out work at home, and TELEQB which asks whether it is possible to work at home without using both telephone and computer. TELEQA and TELEQB are only asked of main respondents to the survey. For more information about these variables, see the Labour Force Survey user guidance

Use of social media applications for business purposes

Using social media for business activities is becoming more common. By switching marketing, recruitment and customer feedback services from face-to-face to a technological service, employees may be able to undertake these tasks remotely.

Figure 6: Over 85% of businesses using social media in the accommodation and food services, and retail industries used it to develop brand image and for marketing purposes

Proportion of UK businesses using social media applications by industry, 2018

Notes:

1. Coverage: businesses who use social media
2. Percentages will sum to more than 100 as businesses may use social media for multiple purposes
3. G Wholesale retail repair of vehicles has been split into Retail trade (47) and Wholesale trade with retail trade and repair of vehicles (45 and 46)
4. Other includes: L Real estate activities, M Professional, scientific and technical activities (excluding 75 Veterinary activities), N Admin and support services, 95.1 Repair of computers and communication equipment

Download the data

.xls

Across all industries, social media applications are most commonly used to develop a business' image or market products, with 70% of UK businesses with social media using it for this purpose. This was most popular in the retail trade, and accommodation and food services industries, being used by 87% and 86% of businesses with social media in those industries respectively. Within each industry at least one-quarter of all businesses using social media used it to obtain or respond to customers’ opinions.

Homeworking is most common in the information and communication industry where over 60% of businesses using social media applications used them to develop their business image and 44% to collaborate with other businesses.

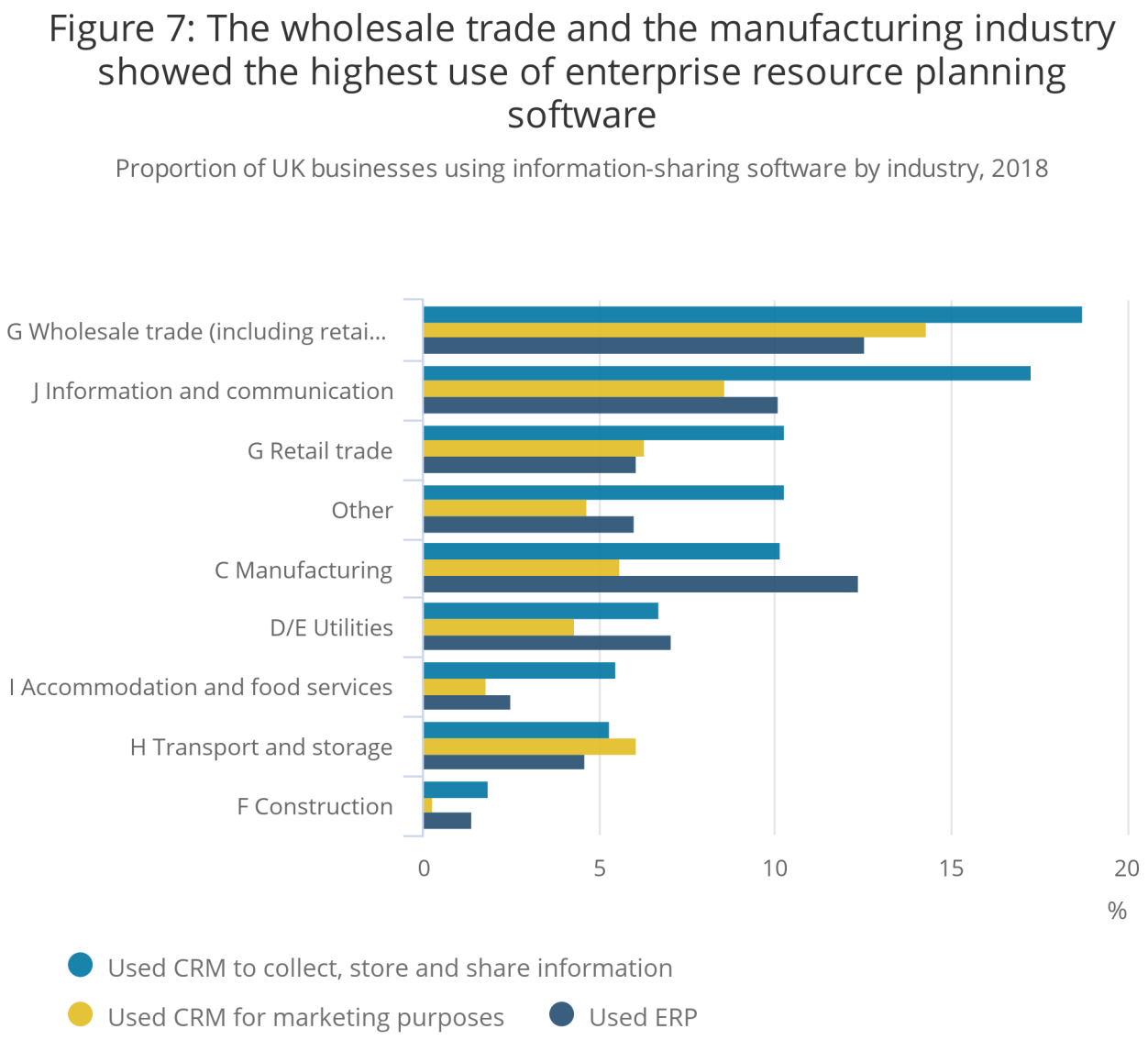
The accommodation and food services industry showed the highest proportion of businesses using social media applications. Social media in this industry was used for obtaining and responding to customer feedback and for recruiting employees by 75% and 47% of businesses with social media respectively. As previously highlighted, this industry may require work to be undertaken in a specific environment, and not all employees will be able to work from home.

Use of information sharing software

Information-sharing software such as enterprise resource planning (ERP) and customer relationship management (CRM) enables communication and collaboration across businesses by providing the sharing of information and ideas. Software allows employees to access documents, data and other collaboration tools required from remote workplaces. As a tool for effective communication and project management, the software may help facilitate homeworking.

Figure 7: The wholesale trade and the manufacturing industry showed the highest use of enterprise resource planning software

Proportion of UK businesses using information-sharing software by industry, 2018



Source: Office for National Statistics – E-commerce Survey

Notes:

1. G Wholesale retail repair of vehicles has been split into Retail trade (47) and Wholesale trade with retail trade and repair of vehicles (45 and 46).

2. Other includes: L Real estate activities, M Professional, scientific and technical activities (excluding 75 Veterinary activities), N Admin and support services, 95.1 Repair of computers and communication equipment.

Figure 7 shows the proportion of businesses using ERP, those who use CRM to ccollect, store and share information about customers with other internal business functions and those who use CRM to analyse information about customers for marketing purposes.

Using CRM was more common than using ERP, with almost 10% of all businesses using CRM to collect, store and share information. The information and communication, and wholesale trade industries showed a high proportion of businesses using information-sharing software. Such software may be used remotely when working from home.

Notes for: Usage

1. Blank, G and Dutton, W.H., with Lefkowitz, J. (2019) Perceived Threats to Privacy Online: The Internet in Britain. Oxford Internet Survey 2019. Oxford Internet Institute, University of Oxford.

6 . Skills

For effective homeworking, businesses must provide adequate training in technology. The skills technology intensity indicator captures the recruitment of technology specialists, and training for staff.

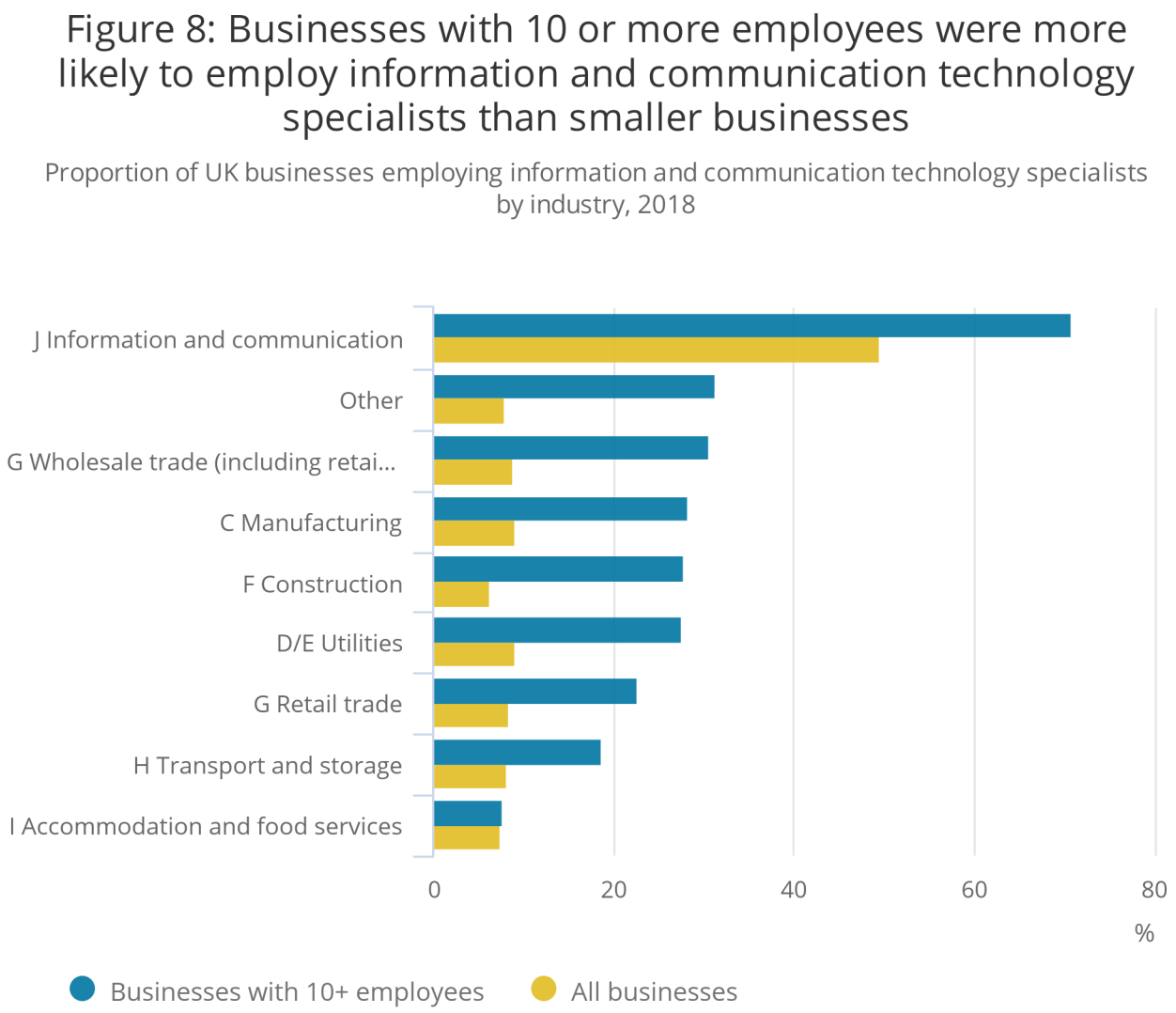
Office for National Statistics (ONS) analysis exploring the digital divide found the most common reason for not having internet access in the household is a perceived lack of need, followed by a lack of skills. The lack of skills has also been reported by many older people who express the feeling that it is simply too late in life for them to start learning digital skills. Almost double the percentage of disabled respondents identified a lack of skills or knowledge as a reason for not accessing the internet compared with non-disabled respondents. For effective homeworking using technology, basic skills are required across the population.

Recruitment

Recruiting technology specialists may reflect a desire from businesses to develop more advanced technological systems, and to provide technical support to other employees.

Figure 8: Businesses with 10 or more employees were more likely to employ information and communication technology specialists than smaller businesses

Proportion of UK businesses employing information and communication technology specialists by industry, 2018



Source: Office for National Statistics - E-commerce Survey

Notes:

1. G Wholesale retail repair of vehicles has been split into Retail trade (47) and Wholesale trade with retail trade and repair of vehicles (45 and 46).

2. Other includes: L Real estate activities, M Professional, scientific and technical activities (excluding 75 Veterinary activities), N Admin and support services, 95.1 Repair of computers and communication equipment.

With the exception of the accommodation and food services, and information and communication industries, businesses with 10 or more employees were more than twice as likely to employ information and communication technology (ICT) specialists.

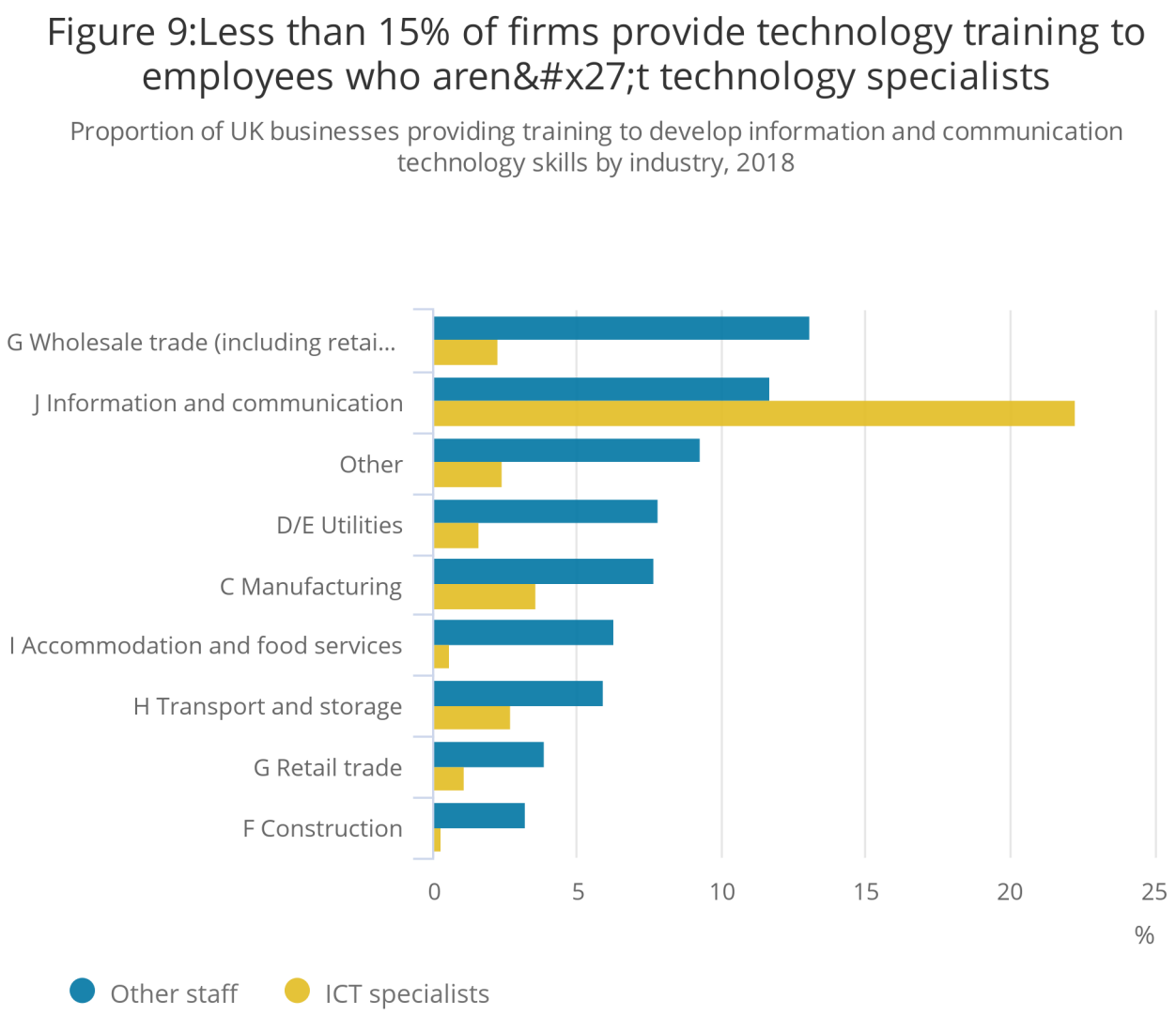
Larger businesses may have more resources and business need for employing specialists. These specialists may help facilitate homeworking by developing systems that can be accessed remotely, and by providing support across the business.

Training

The E-commerce Survey provides insight into the technology training provided, and whether this is provided to technology specialists, or to other employees who may require basic training in order to access digital systems remotely, and to work effectively from home.

Figure 9:Less than 15% of firms provide technology training to employees who aren't technology specialists

Proportion of UK businesses providing training to develop information and communication technology skills by industry, 2018



Source: Office for National Statistics - E-commerce Survey

Notes:

1. G Wholesale retail repair of vehicles has been split into Retail trade (47) and Wholesale trade with retail trade and repair of vehicles (45 and 46).

2. Other includes: L Real estate activities, M Professional, scientific and technical activities (excluding 75 Veterinary activities), N Admin and support services, 95.1 Repair of computers and communication equipment.

Figure 9 shows how businesses split their technology training between technology specialists and other staff. For all industries with the exception of the information and communication industry itself, other staff received considerably more training than specialists. One possible reason for this may be that businesses in these industries are trying to upskill employees in technology, which can be used for more effective homeworking. Businesses may also wish to capture the productivity gains associated with technology.

7 . Conclusions

The extent to which an employee can work from home depends on whether a specific physical environment, tools or machinery, or proximity to others are required for their role. Technology, specifically designed to enable the completion of tasks remotely, also affects the ability of an employee to homework.

Access to technology and to the internet differs across industries. According to the E-commerce Survey, less than half of all employees were provided with a portable device for work, except in the information and communication industry. When only considering internet speed and the type of jobs most common, and in the absence of all other factors, homeworking in London appears more possible than in other regions. Less than 10% of businesses across all industries (except the information and communication industry) employed information and communication technology (ICT) specialists, however, such specialists were more common in larger businesses.

Across all industries, social media applications were most commonly used to develop a business's image or market products. The accommodation and food services, and the retail trade industries showed the highest proportion of businesses using social media applications.

The nature of the technology in the information and communication industry makes it most capable, in general, of homeworking. Figure 1 showed this to be the case, with over half of those employed reporting to have ever worked from home. The wholesale trade and utilities industries also have higher technology intensity, which may enable homeworking for tasks not requiring the employee is in a specific location or with access to tools unavailable at home.

8 . Authors

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